

Algebra 2 MIDTERM - Quarter 1

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

Simplify the given expression.

1. $\left(15x^2 + 11xy - 19y^2\right) - \left(6x^2 - 3xy\right)$
 a. $9x^2 + 8xy - 19y^2$ b. $9x^2 + 14xy - 19y^2$ c. $9x^2 - 11xy - 16y^2$ d. $9x^2 - 14xy$
2. $20 \div 5 \cdot 2$
 a. 10 b. 2 c. 8 d. 4
3. $4 + \left[-2(4 - 1)\right]^2$
 a. -32 b. 40 c. -14 d. -2
4. $\sqrt{16} + \left\{10 \div \left[11 - (5 + 1)\right]\right\}$
 a. 5.43 b. 10 c. 6 d. 11
5. $\frac{-3 - \sqrt{3^2 - 4 \cdot 1 \cdot 2}}{2 \cdot 1}$
 a. -3.08 b. 2 c. -3.5 d. -2
6. $2(x + 3y) - 3(4x + y)$
 a. $-10x + 6y$ b. $-10x + 3y$ c. $14x + 3y$ d. $-4x - 4y$

Evaluate the function.

7. Find the value of $f(-10)$ if $f(x) = -10x + 9$.
 a. $f(-10) = -30$ b. $f(-10) = 91$ c. $f(-10) = -1$ d. $f(-10) = 109$

Find the slope.

8.

X	Y
-1	4
0	6
1	8

- a. $\frac{1}{2}$ b. -2 c. 2 d. $-\frac{1}{2}$

9. $y = -\frac{1}{4}x - 8$

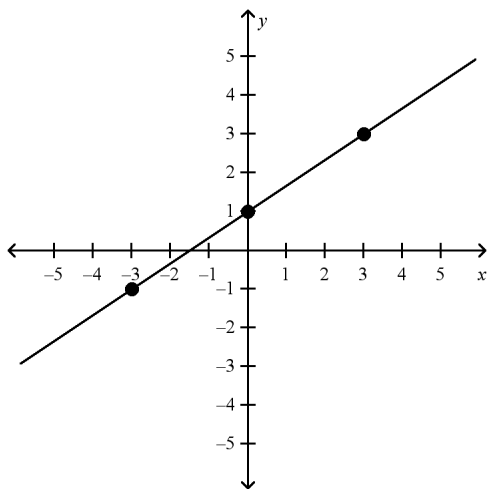
- a. $-\frac{1}{4}$ b. -8 c. -1 d. 4

10. $x = -5$

- a. -5 b. undefined c. 0 d. $-\frac{1}{5}$

11. $y = 3$

- a. 0 b. undefined c. 1 d. 3



12.

- a. $\frac{3}{2}$ b. 1 c. $\frac{2}{3}$ d. $-\frac{2}{3}$

Solve the given formula for the specified variable.

13. $u = \frac{f}{t}$, for t

a. $t = f$

b. $t = uf$

c. $t = \frac{u}{f}$

d. $t = \frac{f}{u}$

Write the equation of the line that satisfies the given conditions.

14. Goes through the points $(-2, 4)$ and $(0, 8)$

a. $y = 2x + 4$

b. $y = 2x + 8$

c. $y = -2x + 4$

d. $y = -2x + 8$

15. slope of 4, and passes through $(2, 20)$

a. $y = 20x + 12$

b. $y = 2x - 2$

c. $y = 4x - 20$

d. $y = 4x + 12$

16.

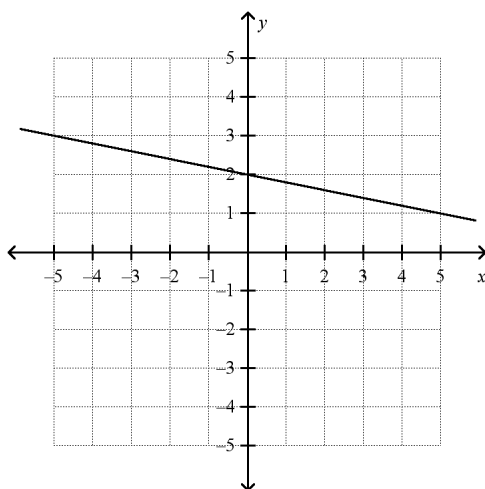
x	y
-2	-5
0	2
2	9
4	16

a. $y = \frac{7}{2}x + 2$

b. $y = \frac{2}{7}x + 2$

c. $y = -\frac{7}{2}x + 2$

d. $y = \frac{7}{2}x - 5$



17.

a. $y = -5x + 2$

b. $y = \frac{1}{5}x + 2$

c. $y = 5x + 2$

d. $y = -\frac{1}{5}x + 2$

Combine the functions as requested.

18. Find $(f+g)(x)$ for the following functions.

$$f(x) = 14x^2 + 6x + 8$$

$$g(x) = 5x + 6$$

a. $14x^2 + 11x + 14$ b. $19x^3 + 12x + 8$ c. $14x^2 + 11x + 8$ d. $19x^2 + 12x + 8$

19. Find $\left(\frac{f}{g}\right)(x)$ for

$$f(x) = 10x^2 - 3x + 2$$

$$g(x) = 3x^2 - 4$$

a. $\frac{10x^2 - 3x}{3x^2} - 2$ b. $\frac{10x^2 - 3x + 2}{3x^2 - 4}$ c. $\frac{3x^2 - 4}{10x^2 - 3x + 2}$ d. $\frac{10x^3 - 3x^2 + 2x}{3x^2 - 4} \cdot x$

20. Find $(f \cdot g)(x)$ for $f(x) = 2x^2 + 3x - 6$ and $g(x) = 4x$

a. $6x^3 + 7x^2 - 2x$ b. $8x^3 + 3x - 6$ c. $8x^3 + 12x^2 - 24x$ d. $8x^2 + 12x - 24$

21. Find $(f-g)(x)$ for the following functions.

$$f(x) = 13x + 19$$

$$g(x) = -12x^2 + 9x + 26$$

a. $25x^2 - 9x - 7$ c. $12x^2 + 4x - 7$
b. $-12x^2 - 4x + 7$ d. $-12x^2 - 4x - 7$

Answer the questions based on the following scenario.

22. The school is hosting a car wash fundraiser to expand the athletic programs. \$35 is spent on supplies in preparation and the school earns \$3 for every car they wash. What are the independent and dependent variables in this situation?

a. independent: profit
dependent: number of cars washed c. independent: number of cars washed
dependent: profit
b. independent: 35 dollars
dependent: 3 dollars d. independent: supplies
dependent: fundraiser

23. Write an equation that models the situation.

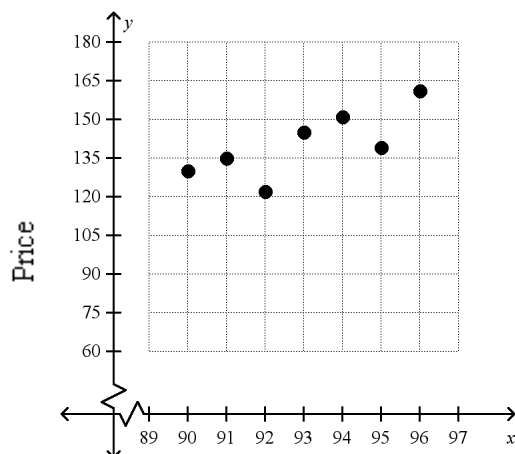
a. $y = -3x - 35$ b. $y = 3x + 35$ c. $y = 35x + 3$ d. $y = 3x - 35$

24. How much money will the school have raised if we wash 100 cars at the car wash?

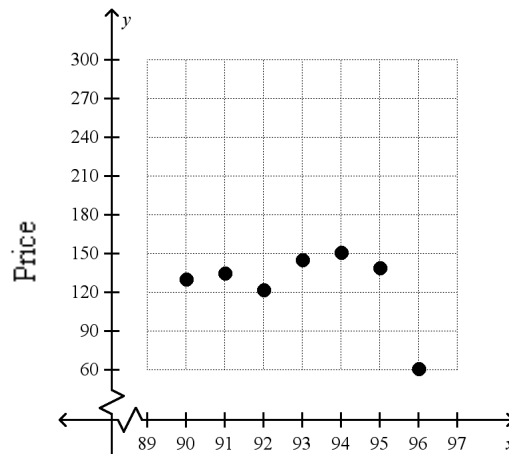
a. \$300 b. \$265 c. \$335 d. \$3500

25. The table below shows the median selling price of houses in the 1990s. Draw a scatter plot based on the data.

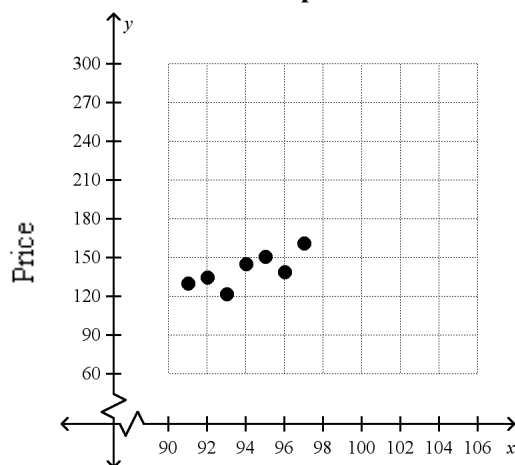
Year	1990	1991	1992	1993	1994	1995	1996
Price (\$ thousands)	130	135	122	145	151	139	61



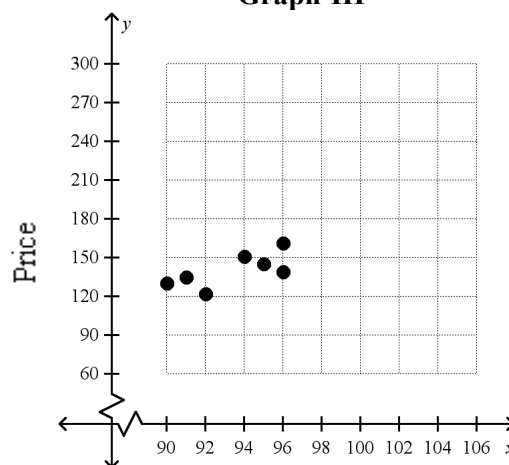
Graph I



Graph III



Graph II



Graph IV

- a. Graph I b. Graph II c. Graph III d. Graph IV

State the function family that fits each situation.

26. $y = x^2$

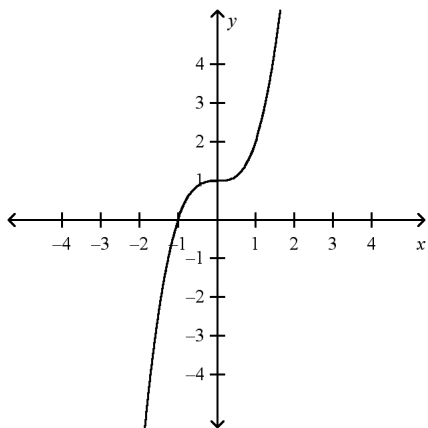
- a. linear b. quadratic c. cubic d. exponential

27. $y = e^x$

- a. logarithmic b. exponential c. quadratic d. inverse

28. $y = x$

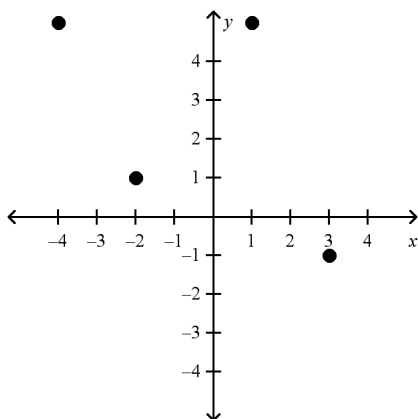
- a. Exponential b. Linear c. Quadratic d. Cubic



29.

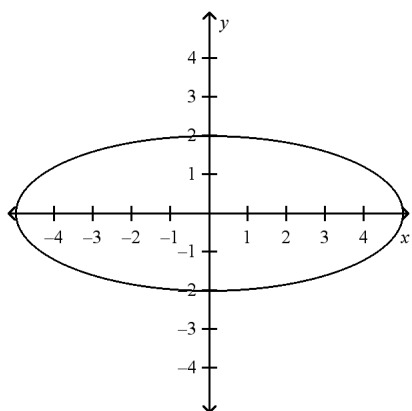
- a. Exponential b. Trigonometric c. Cubic d. Quartic

Are the following relations a function?



30.

- a. Yes, a function b. No, not a function



31.

- a. Yes, a function b. No, not a function

32. D R

$$\begin{bmatrix} -3 \\ 0 \\ 2 \\ 5 \end{bmatrix} \qquad \begin{bmatrix} -5 \\ 2 \\ 4 \end{bmatrix}$$

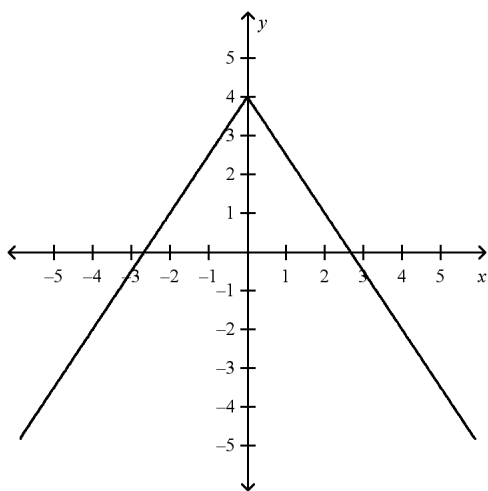
- a. Yes, a function b. No, not a function

33. $\{(0,4), (3,5), (-4,-1), (2,7), (3,-2)\}$

- a. Yes, a function b. No, not a function

Give the domain and range of each function or relation.34. $\{(-4,4), (2,0), (2,6), (-1,5), (6,-3)\}$

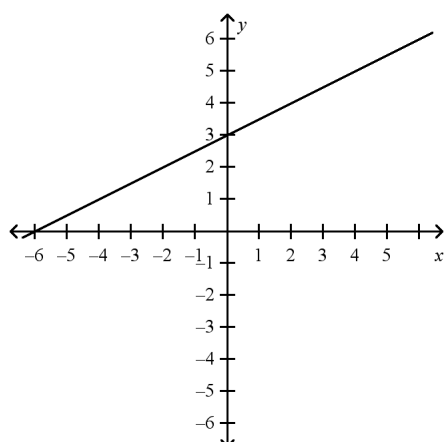
- a. $D: \{-4, -1, 2, 6\}$ b. $D: \{-3, 0, 4, 5, 6\}$ c. $D: \{-4, -3, -1\}$ d. $D: \{-4, -1, 2, 2, 6\}$
 $R: \{-3, 0, 4, 5, 6\}$ $R: \{-4, -1, 2, 6\}$ $R: \{0, 2, 4, 5, 6\}$ $R: \{-3, 4, 5, 6\}$



35.

- a. D: All real numbers
R: All real numbers b. D: $[-2.8, 2.8]$
R: All real numbers c. D: All real numbers
R: $(-\infty, 4]$ d. D: IDK
R: IDK

Match the equation with the graph.



36.

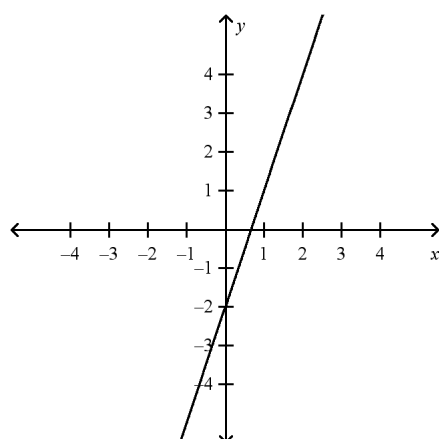
a. $y = \frac{1}{2}x - 6$

b. $y = 2x + 3$

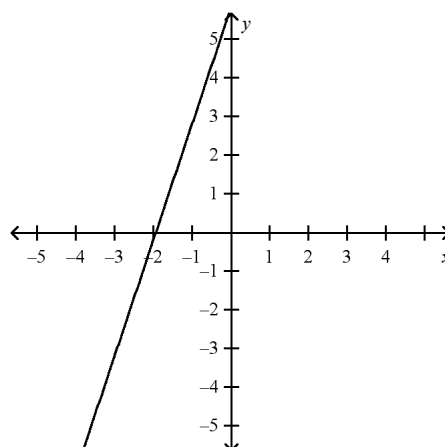
c. $y = \frac{1}{2}x + 3$

d. $y = -\frac{1}{2}x - 6$

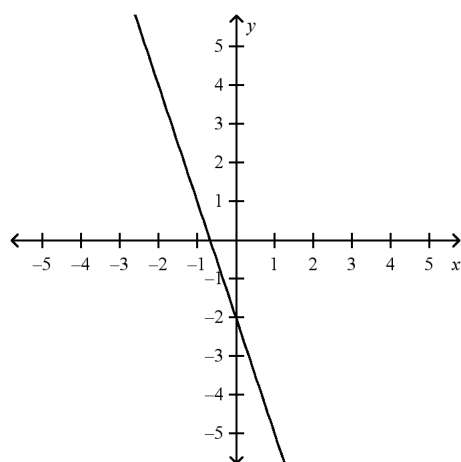
37. $y = 3x - 2$



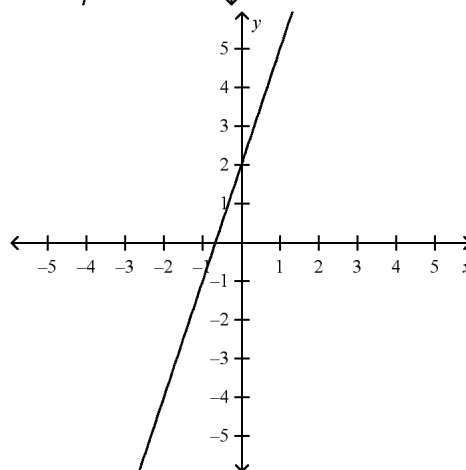
a.



c.



b.



d.

Simplify.

38. $\sqrt{96}$
 a. $4\sqrt{6}$ b. $16\sqrt{6}$ c. $2\sqrt{6}$ d. $4\sqrt{12}$
39. $3\sqrt{20}$
 a. $2\sqrt{5}$ b. $6\sqrt{5}$ c. $12\sqrt{5}$ d. $6\sqrt{10}$

Rationalize.

40. $\frac{8}{\sqrt{3}}$
 a. $\frac{24}{\sqrt{3}}$ b. $\frac{8\sqrt{3}}{\sqrt{3}}$ c. $\frac{8\sqrt{3}}{3}$ d. $\frac{8}{3}$

Translate the following verbal expression into an algebraic expression:

41. Five less than the product of three and a number squared.
 a. $3x^2 - 5$ b. $5 - 3x^2$ c. $(3 + x^2) - 5$ d. $\frac{x^2}{3} - 5$
42. eight more than the product of a number and 100
 a. $100x + 8$ b. $100x - 8$ c. $100 + 8x$ d. $8 - 100x$

Describe how each function is a transformation of the parent function $y=x$.

43. $y = 5x + 3$
 a. steeper
shift up 3 b. flatter
shift up 3 c. reflected
steeper d. flatter
shift down 3
44. $y = -\frac{1}{7}x - 4$
 a. Flatter
Shift left 4 b. Reflected
Shift down 4
Flatter c. Steeper
Reflected
Shift down 4 d. Steeper
Shift up 4

Solve the given equation.

45. $46p - 14 = 36$
 a. 3.57 b. 0.82 c. 0.48 d. 1.09

46. $9.16p - 11 = 24 + 7.16p$
 a. $\frac{35}{1.3}$ b. $\frac{0.35}{2}$ c. $\frac{35}{2}$ d. $\frac{2}{35}$
47. $22 = -11(y + 7)$
 a. 4.00 b. -99.00 c. -9 d. 6.24
48. Find the value of $g(-7)$ if $g(x) = 8x^2 - 20x$.
 a. $g(-7) = 24$ c. $g(-7) = 532$
 b. $g(-7) = -979$ d. $g(-7) = 13$

The following carryout combinations are available at Mike's carryout joint.

One pizza, one coke, one bag of chips	\$9.00
One pizza, two cokes	\$10.00
Two pizzas, two bags of chips	\$12.00

49. Assume that p=pizza, c=coke, and b=bag of chips.
 Create a system of equations to represent this situation.
- a. $p + b = 9$ b. $p + c + b = 9$ c. $p + c + b = 9$ d. $p + c + b = 3$
 $p + 2c = 10$ $p + 2c = 10$ $p + c = 10$ $p + 2c = 3$
 $2p + 2b = 12$ $2p + 2b = 12$ $p + b = 12$ $2p + 2b = 4$
50. Assume that the price of a combo meal is the same price as purchasing each item separately. Find the price of a pizza, a coke, and a bag of chips.
 a. pizza: \$2, coke: \$4, bag of chips: \$3 c. pizza: \$3, coke: \$2, bag of chips: \$4
 b. pizza: \$2, coke: \$3, bag of chips: \$4 d. pizza: \$4, coke: \$3, bag of chips: \$2

Find the inverse of the given relation.

51. $\{(4, 4), (5, -6), (4, -5), (9, -9)\}$
 a. $\{(4, 4), (-6, 5), (-5, 4), (-9, -9)\}$
 b. $\{(4, 4), (-6, 5), (-5, -4), (-9, 9)\}$
 c. $\{(4, 4), (-6, 5), (-5, 4), (-9, 9)\}$
 d. $\{(4, 4), (6, -5), (-5, 4), (-9, 9)\}$

52. Find $[g \circ h](x)$ and $[h \circ g](x)$.

$$g(x) = 5x$$

$$h(x) = -7x - 12$$

a. $[g \circ h](x) = -35x^2 - 60x$

$$[h \circ g](x) = -35x^2 - 12x$$

b. $[g \circ h](x) = -35x + 60$

$$[h \circ g](x) = -35x + 12$$

c. $[g \circ h](x) = -35x - 60$

$$[h \circ g](x) = -35x - 60$$

d. $[g \circ h](x) = -35x - 60$

$$[h \circ g](x) = -35x - 12$$

53. A farmhouse shelters 10 animals. Some are pigs and some are ducks. Altogether there are 36 legs. How many of each animal are there?

a. 9 ducks
1 pig

b. 2 ducks
8 pigs

c. 8 ducks
2 pigs

d. 3 ducks
7 pigs

Algebra 2 MIDTERM - Quarter 1
Answer Section

MULTIPLE CHOICE

1. B
2. C
3. B
4. C
5. D
6. B
7. D
8. C
9. A
10. B
11. A
12. C
13. D
14. B
15. D
16. A
17. D
18. A
19. B
20. C
21. C
22. C
23. D
24. B
25. C
26. B
27. B
28. B
29. C
30. A
31. B
32. A
33. B
34. A
35. C
36. C
37. A
38. A
39. B
40. C

- 41. A
- 42. A
- 43. A
- 44. B
- 45. D
- 46. C
- 47. C
- 48. C
- 49. B
- 50. D
- 51. C
- 52. D
- 53. B